

## REMARKS

In the Office Action, the Examiner objected to the drawings. The Examiner also agreed to keep provisional double-patenting rejection of claims 1, 2, 5, 6, 8, 9, 12, and 13 in abeyance until allowable subject matter is indicated. The Examiner also rejected claims 1, 2, 8, 9, 15, and 17 under 35 U.S.C. §102 (b) as being anticipated by U.S. Patent No. 7,079,581 to Noh et al. (“Noh”). The Examiner also rejected claims 5-7 and 12-14 under 35 U.S.C. §102 (b) as being anticipated by U.S. Patent No. 6,160,846 to Chiang et al. (“Chiang”). The Examiner also rejected claims 3-4, 10-11, 16, and 18 under 35 U.S.C. §103(a) as being unpatentable over Noh.

In this Amendment, Applicants have not amended, added, or canceled any claims. Accordingly, claims 1-18 will be pending after entry of this Amendment.

### **I. Objection to Drawings**

In the Office Action, the Examiner required that either Figure 1 be designated as prior art or the Application be amended to remove a reference to Figure 1 that states the digital video recorder labeled 100 is well known in the art. *See*, page 3 of the Office Action. Applicants respectfully submit that although the system of Figure 1 is known in the art, it is a high level diagram of a system in which some embodiments of the invention can be implemented.

Accordingly, Applicants have amended the Specification to recite that Figure 1 illustrates a high level block diagram of a typical digital video encoder 100 with which some embodiments of the invention are implemented. Applicants have also amended the “Brief Description of the Diagrams” section of the Specification for a similar amendment. Accordingly, Applicants respectfully request reconsideration and withdrawal of the objections to the drawings.

## II. Double Patenting Claim Rejections

In the Office Action, the Examiner has agreed to Applicants' request to keep provisional double patenting rejection of claims 1, 2, 5, 6, 8, 9, 12, and 13 in abeyance until the allowable subject matter is determined. Applicants thank the Examiner.

## III. Claims 1-4

In the Office Action, the Examiner rejected claims 1-2 under §102(b) as being anticipated by Noh. The Examiner also rejected claims 3-4 under 35 U.S.C. §103(a) as being unpatentable over Noh. Claims 2-4 are directly or indirectly dependent on claim 1.

Claim 1 recites a method of scaling digital video information. The method accepts a scaling relaxation value. The scaling relaxation value specifies an amount to relax a scaling performed to prevent buffer underflow or overflow. The method adjusts a scaling value with the scaling relaxation value. The method encodes the digital video information by utilizing the adjusted scaling value.

Applicants respectfully submit that Noh does not anticipate claim 1 for at least the following reasons. *First*, Noh does not disclose, teach, or even suggest an encoding method that accepts a scaling relaxation value where the scaling relaxation value specifies an amount to relax a scaling performed to prevent buffer underflow or overflow. The Office Action cites Figure 1 and column 3, lines 3-12 of Noh for disclosing a variable bit rate (VBR) encoder that stores images in storage unit labeled 90 through buffer labeled 80. *See*, page 5 of the Office Action. The Office Action also cites column 9, lines 1-7 of Noh for disclosing that: "[t]o adjust a variation in the quantization factor, it is important to check the level of a buffer to see if the overflow occurs in the buffer. For instance, if the level of the buffer reaches above a predetermined level, overflow may occur in the buffer. In this case, the present quantization factor is adjusted to be higher in a range of the maximum variation than the previous quantization factor." Applicants

respectfully submit that the cited paragraphs and Figure of Noh disclose adjusting variation in the quantization factor based on the level of the buffer but they do not disclose a relaxation value to relax such adjusting.

Accordingly, Noh does not disclose, teach, or even suggest an encoding method that  
5 accepts a scaling relaxation value where the scaling relaxation value specifies an amount to relax a scaling performed to prevent buffer underflow or overflow.

*Second*, Noh does not disclose, teach, or even suggest an encoding method that adjusts a scaling value with a scaling relaxation value. The Office Action cites column 8, lines 4-60 and column 9, lines 1-7 of Noh and states that the deviation parameter D disclosed in Noh determines  
10 the variation of quantization adjustment parameter K, which in turn allows for variation in the quantization factor. The variation of the quantization factor, in turn, is driven at least to prevent buffer overflow and underflow. *See*, page 9 of the Office Action. Applicants respectfully submit that in order to make claim 1 unpatentable, the Examiner has a prima facie obligation to show that Noh discloses an encoding method that adjusts a scaling value with a scaling relaxation  
15 value. “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). None of the paragraphs cited and the text recited in the Office Action points to such a disclosure in the cited reference. Accordingly, Applicants respectfully submit that the Examiner has failed to identify  
20 how the limitations of claim 1 are disclosed or made unpatentable by either Chiang.

#### **IV. Claims 5-7**

In the Office Action, the Examiner rejected claims 5-7 under §102(b) as being anticipated by Chiang. Claims 6-7 are dependent on claim 5.

Claim 5 recites a method of tracking digital video information complexity. The method determines a complexity measure for a current digital video picture. The method also combines the complexity measure for the current digital video picture to a running average complexity measure for a series of digital video pictures in a manner that prevents the current digital video picture from significant changing of the running average complexity measure for a series of digital video pictures. The method encodes the digital video information by utilizing the running average complexity measure.

Applicants respectfully submit that Chiang does not anticipate claim 5 for at least the following reasons. Chiang does not disclose, teach, or even suggest a method that combines a complexity measure for the current digital video picture to a running average complexity measure for a series of digital video pictures in a manner that prevents the current digital video picture from significant changing of the running average complexity measure for the series of digital video pictures.

The Office Action states that the bit rate  $R$  disclosed in Chiang corresponds to the claimed “complexity measure”. *See*, page 10 of the Office Action. Applicants respectfully submit that it is well known in the art that a complexity measure quantifies an inherent complexity of a video picture and is not the same as a bit rate. The Office Action further cites column 10, lines 65-67 of Chiang and states that the quantizer scale  $Q$  is initially determined as an average of the quantizer scales used to code the macroblocks in the previous picture and this corresponds with the claimed running average complexity measure. Applicants respectfully submit that as correctly quoted by the Examiner, the cited lines of Chiang disclose a quantizer scale that is an average of the quantizer scales to code the macroblocks. The cited lines, however, do not disclose a running average complexity measure as a quantizer scale is different than a complexity measure.

Applicants respectfully submit that none of these alleged features disclosed by Chiang anticipate claim 5. In order to show claim 5 is anticipated, the Examiner has a prima facie obligation to show that Chiang discloses a method that combines a complexity measure for the current picture to a running average complexity measure for a series of digital video pictures in a manner that prevents the current digital video picture from significant changing of the running average complexity measure for the series of digital video pictures.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Accordingly, Applicants respectfully submit that the Examiner has failed to identify how the limitations of claim 5 are disclosed in Chiang.

In view of the foregoing remarks, Applicants respectfully submit that Chiang does not render claim 5 unpatentable. As claims 6-7 are dependent on claim 5, Applicants respectfully submit that claims 6-7 are patentable over Chiang for at least the reasons that were discussed above for claim 5. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 5-7.

## **V. Claims 8-11**

In the Office Action, the Examiner rejected 8-9 under §102(b) as being anticipated by Noh. The Examiner also rejected claims 10-11 under §103(a) as being unpatentable over Noh.

Claim 8 recites a computer-readable medium that stores a computer program that can be executed by at least one processor. The program can implement a method of scaling digital video information. The computer program includes sets of instructions for accepting a scaling relaxation value. The scaling relaxation value specifies an amount to relax a scaling performed to prevent buffer underflow or overflow. The computer program also includes sets of instructions



adjusting a scaling value with the scaling relaxation value. The computer program also includes sets of instructions for encoding the digital video information utilizing the adjusted scaling value.

Applicants respectfully submit that Noh does not make claim 8 unpatentable for at least the following reasons. *First*, Noh does not disclose, teach, or even suggest a computer program that accepts a scaling relaxation value where the scaling relaxation value specifies an amount to relax a scaling performed to prevent buffer underflow or overflow. *Second*, Noh does not disclose, teach, or even suggest a computer program that adjusts a scaling value with a scaling relaxation value. In the Office Action, the Examiner rejected claim 8 for the same reasons as claim 1. *See*, page 7 of the Office Action. Accordingly, Applicants respectfully submit that the Noh does not make claim 8 unpatentable for at least the same reasons given in relation with claim 1, above

In view of the foregoing remarks, Applicants respectfully submit that Chiang, Noh, or their combination do not render claim 8 unpatentable. As claims 9-11 are dependent on claim 8, Applicants respectfully submit that claims 9-11 are patentable over Chiang for at least the reasons that were discussed above for claim 8. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 8-11.

## **VI. Claims 12-14**

In the Office Action, the Examiner rejected claims 12-14 under §102(b) as being anticipated by Chiang. Claims 13-14 are dependent on claim 12.

Claim 12 recites a computer-readable medium that stores a computer program that can be executed by at least one processor. The computer program can track digital video information complexity. The computer program includes sets of instructions for (1) determining a complexity measure for a current digital video picture, (2) for combining the complexity measure for the current digital video picture to a running average complexity measure for a series of digital video

pictures in a manner that prevents the current digital video picture from significant changing the running average complexity measure for the series of digital video pictures, and (3) for encoding the digital video information by utilizing the running average complexity measure.

Applicants respectfully submit that Chiang does not anticipate claim 12 for at least the following reasons. Chiang does not disclose, teach, or even suggest a method that combines a complexity measure for the current digital video picture to a running average complexity measure for a series of digital video pictures in a manner that prevents the current digital video picture from significant changing of the running average complexity measure for the series of digital video pictures.

In the Office Action, the Examiner rejected claim 12 for the same reasons as claim 5. *See*, page 7 of the Office Action. Accordingly, Applicants respectfully submit that the Chiang does not anticipate claim 12 for at least the same reasons given in relation with claim 5, above. As claims 13-14 are dependent on claim 12, Applicants respectfully submit that claims 12-14 are patentable over Chiang for at least the reasons that were discussed above for claim 12. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 12-14.

## **VII. Claims 15-16**

In the Office Action, the Examiner rejected claim 15 under §102 (b) as being anticipated by Noh. The Examiner also rejected claim 16 under §103(a) as being unpatentable over Noh.

Claim 16 is dependent on claim 15.

Claim 15 recites a method of encoding a sequence of video frames. The method allocates an initial value for a bit budget for a current frame in the sequence of video frames. The method determines an initial value for a scale value based on a percentage of a memory buffer space used. The scale value can scale the bit budget to prevent an underflow or an overflow of the

memory buffer. The method determines a relaxation control value to relax the scaling of the bit budget. The method determines a final bit budget for the current frame based on the scale value adjusted with the relaxation control value. The method encodes the current video frame by using the final bit budget.

5 Applicants respectfully submit that Noh does not anticipate claim 15 for at least the following reasons. *First*, the Office Action does not state where the Noh disclose a relaxation control value for scaling the bit budget. *Second*, the Office Action does not state where Noh disclose determining a final bit budget for the current frame based on the scale value adjusted with the relaxation control value. Accordingly, the Examiner has not met his prima facie  
10 obligation of showing how a §102 reference discloses all limitations of a claimed limitation.

In view of the foregoing, Applicants respectfully submit that Noh does not anticipate claim 15, As claim 16 is dependent on claim 15, Applicants respectfully submit that claim 16 is patentable over Noh for at least the reasons that were discussed above for claim 15. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of  
15 claims 15-16.

### **VIII. Claims 17-18**

In the Office Action, the Examiner rejected claim 17 under §102 (b) as being anticipated by Noh. The Examiner also rejected claim 18 under §103(a) as being unpatentable over Noh. Claim 18 depends on claim 17.

20 Claim 17 recites a computer-readable medium that stores a computer program for execution by at least one processor. The computer program can encode a sequence of video frames. The computer program includes sets of instructions (1) for allocating an initial value for a bit budget for a current frame in the sequence of video frames, (2) for determining an initial value for an scale value based on a percentage of a memory buffer space used, where the scale



value is for scaling the bit budget to prevent an underflow or an overflow of said memory buffer, (3) for determining a relaxation control value to relax the scaling of the bit budget, (4) determining a final bit budget for the current frame based on the scale value adjusted with the relaxation control value, and (5) encoding the current video frame using the final bit budget.

5 In the Office Action, the Examiner rejected claim 17 for the same reasons as claim 15.

See, page 10 of the Office Action. Accordingly, Applicants respectfully submit that the Noh does not anticipate claim 17 for at least the same reasons given in relation with claim 15, above. As claim 17 is dependent on claim 17, Applicants respectfully submit that claim 18 is patentable over Noh for at least the reasons that were discussed above for claim 17. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 17-18.

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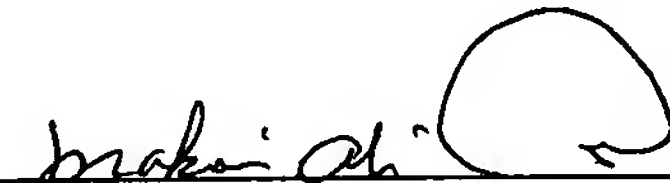
## CONCLUSION

In view of the foregoing, it is submitted that all pending claims, namely claims 1-18 are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance is earnestly solicited at the earliest possible date.

Respectfully submitted,

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